THERMAstor
SUSTAINABLE DESIGN

Walmart Canada Burlington Store

Horizontal Geo-Exchange System

Year	2014
Client	Walmart Canada
Project Location	Burlington, ON
Building Size	~135,000 SQFT
Contract Size	$ 60,000 CAD
Project Size	$ 600,000 CAD
System Size	~15 km horizontal loop beneath parking lot

Who We Are

ThermaStor Solutions Inc. (“TSS”) is a specialized engineering firm advancing geoexchange and energy storage, delivering superior building lifecycle performance while supporting ambitious environmental targets.

Our patented low-clearance drill rig enables geothermal retrofits even in constrained urban sites such as underground parking garages, unlocking decarbonization opportunities for both new construction and existing buildings. By integrating advanced hot and cold underground long-duration thermal storage (LDES) with base-building design conditions, we create unique HVAC demand management strategies that can reduce cooling-related electrical demand by up to 80% during peak hours and shift thermal production to higher-efficiency off-peak periods. This innovative approach provides a compelling financial case while ensuring grid-friendly, resilient, and scalable decarbonization solutions.

Contact:
Evan Ericson, Director
eericson@thermastorsolutions.com
587-998-4090

Technology transfer of the Spiderplow to apply to horizontal geoexchange allowed 15 km of geopiping to be installed in 5 days at a fraction of the cost of a conventional vertical borefield.

ThermaStor Solutions’ founding engineers (with previous firm) played a leading role in the world’s first implementation of a horizontal geo-exchange system beneath a retail parking lot - a groundbreaking energy solution deployed at Wal-Mart’s Burlington Supercentre. In just five days, over 15 kilometers of geoexchange piping were installed using SpiderPlow trenching technology, a method previously reserved for oil and gas applications. This radically reduced the field installation cost and timeframe, transforming an uneconomical 40+ year payback into a viable sub-10-year return on investment.

The system integrated rollout radiant floor mats, a custom super-efficient HVAC system with energy recovery ventilation, specialized air handling units with dehumidification and heat recovery, and a high-performance building envelope. Extensive TRNSYS modeling was used throughout design and post-occupancy phases to refine performance, verify energy savings, and guide HVAC system integration.

The Burlington store went on to reduce its total energy consumption by approximately 60% compared to a typical Supercentre model, validating the effectiveness of the geo-exchange field and its hybrid integration with refrigeration heat recovery. The project remains a model for deep energy savings in big-box retail.

Lessons Learned

Careful coordination and on-site direction are essential during slab construction. In this case, close oversight ensured header pipes embedded in the concrete were not punctured by rebar, preserving system integrity and preventing costly rework.